DIRECT TESTIMONY OF KEVIN LUCAS

ON BEHALF OF

THE SOUTH CAROLINA SOLAR BUSINESS ALLIANCE

EXHIBIT KL-3

DUKE ENERGY CAROLINAS, LLC AND DUKE ENERGY PROGRESS, LLC (DEP)

Request:

Please provide the Companies' 2020 Supply Side Data Manual or equivalent publication. This response should include a discussion on future cost declines expected for such resources.

Response:

The 2020 Generic Unit Summary provides capital and operating cost for generation and storage technologies considered in the IRP and is provided in the attached spreadsheet (PS3DR-7 Confidential - IRP Generic Unit Summary DEC 2020.xlsx). Please note the confidentiality of the file. The EIA AEO forecast factors as shown in the Capital Cost Forecast tab were used to estimate the real technology specific price declines. Note the first 10 years of declining forecast factors for Offshore Wind, Solar PV and Battery Storage "highlighted in green" were developed by a 3rd party consultant and then used the AEO forecast factors through 2050.

Responsible person (name, title): Adam Reichenbach, Lead Engineer - Integrated Systems Planning

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EXHIBIT KL-8

CONFIDENTIAL
Filed Under Seal

Docket Nos. 2019-224-E
and 2019-225-E

DIRECT TESTIMONY OF KEVIN LUCAS
ON BEHALF OF
THE SOUTH CAROLINA SOLAR BUSINESS ALLIANCE

EXHIBIT KL-15

DUKE ENERGY CAROLINAS, LLC AND DUKE ENERGY PROGRESS, LLC

Request:

Please refer to page 160 of the IRP Report. Please provide all information Duke has compiled regarding suitable locations for pumped hydro projects within its geographic footprint.

Response:

Please find the attached confidential study completed by HDR/DTA in 2010 for DEC regarding potential greenfield locations for additional pumped storage located on or about the upper Keowee-Toxaway River basin.

Responsible Person(s) and/or Subject Matter Expert(s): IRP Team
Documents Consulted (if any): see attached

DIRECT TESTIMONY OF KEVIN LUCAS
ON BEHALF OF
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EXHIBIT KL-16

CONFIDENTIAL
Filed Under Seal

Docket Nos. 2019-224-E
and 2019-225-E

DIRECT TESTIMONY OF KEVIN LUCAS
ON BEHALF OF
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EXHIBIT KL-19

DUKE ENERGY CAROLINAS, LLC and DUKE ENERGY PROGRESS, LLC

To the extent information differs for DEC and DEP, provide the different information, otherwise please note the information provided is the same for both.

Request:

2-3 Regarding the Company's natural gas price and CO2 price forecasts.

a. Please provide the Company's process for deriving its nominal base, low and high Henry Hub natural gas price forecast and provide all workpapers electronically that were used to develop the nominal Henry Hub natural gas price forecast that were used in economic analyses.

b. Please provide the Company's process for deriving its nominal base, low and high CO2 price forecast and provide all workpapers electronically that were used to develop the nominal CO2 forecasts. Also, please supply all forecast associated deflators used to convert between nominal and real dollar forecasts.

c. Please provide all other recent alternative CO2 forecasts in the Company's possession. Please supply all forecast associated deflators used to convert between nominal and real dollar forecasts.

Response:

a. The company developed Henry Hub price forecasts by combining the actual transactable forward market for natural gas with a fundamental forecast for out years as described below. The base forecast for the 2020 IRP uses an April 9, 2020 natural gas strip purchased by the Company as the market assumption for natural gas price in the IRP modeling. The monthly projections are used for January 2021 through December 2030. The monthly market price from January 2031 through December 2035 is blended with the monthly market prices from IHS Markit's fundamental forecast, North American Natural Gas Long-Term Outlook, February 2020. Beyond 2035, the monthly forecast is used directly from the IHS outlook.

High and low market forecasts were developed using the market settlement curve and implied volatility curve for valuation date of April 9, 2020. To create the 90th percentile and 10th percentile high and low market forecasts, 10,000 iterations with the settlements and volatilities were run with averages across the iterations to develop the market curves at these statistical points.

High and low fundamental forecasts were developed using ratios of the EIA's AEO 2020 Low Oil and Gas Supply and High Oil and Gas Supply cases from the EIA's 2020 Reference case. These

ratios were applied to IHS Markit's Henry Hub Price used in the base IRP forecast to create high and low fundamental forecasts.

The high and low market forecasts were blended with high and low fundamental forecasts, respectively, using the same blending schedule from the base IRP natural gas forecast.

Please refer to attachment 2020 ORS DR 2, 2-3A Confidential.xlsx for workpapers on the development of the Henry Hub natural gas price curves.

2020 ORS DR 2, 2-3A CONFIDENTIAL.xlsx

b. The company's low CO2 price forecast is a No CO2 price scenario, where there is no price on CO2 emissions. The company's base and high CO2 price forecast are based on analyses performed shows a CO2 price starting at $5/ton in 2025 increasing at a rate of $5/ton per year incentivized ZELFR technology in the 2040 to 2050 timeframe, where increasing at a rate of $7/ton accelerated the selection of ZELFRs in the 2035 to 2040 timeframe. Both the $5 and $7/ton year price incentivize battery storage to meet a portion of new peaking need by 2030, additional renewables, accelerated coal retirements and limiting dispatch of carbon emitting generation. These price levels incentivize similar CO2 reductions relative to past legislative proposals, such as Waxman Markey, to limit CO2 output.

c. Please refer to attachment 2020 ORS DR 2, 2-3C.xlsx for all other alternative CO2 Price forecasts in the Company's possession.

2020 ORS DR 2, 2-3C.xlsx